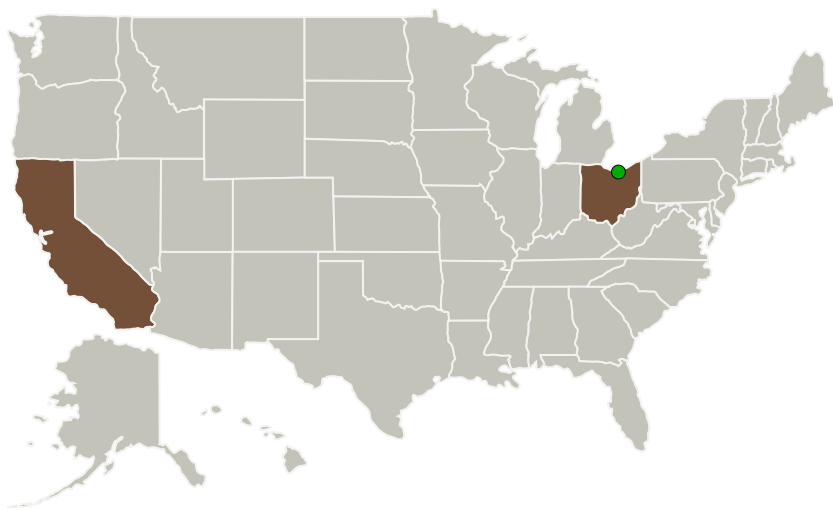




Project Introduction

NASA's latest effort in developing a common platform for space communication and navigation systems is the Space Telecommunications Radio System (STRS) standard. It defines architecture enabling interoperability of Software Defined Radio (SDR) components. Future proof, power conscious architectures of STRS compliant re-configurable SDR transceivers are needed for implementation of envisioned space communication systems. Pacific Microchip Corp. proposes to develop a highly integrated, low-power, multifunctional 56GS/s Direct Digital Modulation/Demodulation (DDM) SDR transceiver using 45nm SOI CMOS technology. The resulting STRS compliant integrated solution will be radiation tolerant by technology and design. The direct conversion based transceiver utilizes novel 56GS/s D/A and A/D converters and features arbitrary waveform generation (AWG) mode. The availability of AWG and DDM modes removes limitations on the synthesized waveform shapes up to 28GHz. Pacific Microchip Corp. proposes all-digital implementation of frequency up- and down-conversion, I/Q modulation and demodulation. Since digital power is mostly dynamic, digital processing will enable power consumption scaling linearly with the operating frequency. Phase I work will provide a complete definition and in-silico validation of the proposed device. The Phase II program will produce a fieldable product. In order to facilitate the commercialization efforts in Phase III, a commercial radiation-tolerant CMOS SOI technology will be used.

Primary U.S. Work Locations and Key Partners



Reconfigurable/Reprogrammable Communications Systems, Phase I

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Reconfigurable/Reprogrammable Communications Systems, Phase I



Completed Technology Project (2012 - 2012)

Organizations Performing Work	Role	Type	Location
Pacific Microchip Corporation	Lead Organization	Industry	Culver City, California
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
California	Ohio

Project Transitions

**February 2012:** Project Start**August 2012:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138454>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Pacific Microchip Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

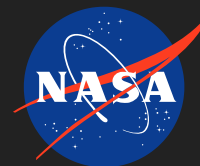
Carlos Torrez

Principal Investigator:

Denis Zelenin

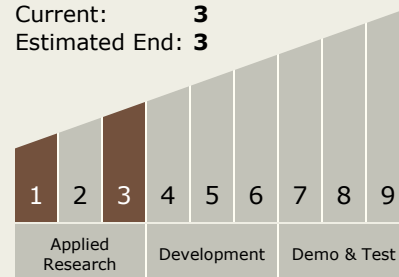
Co-Investigator:

Denis Zelenin



Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.2 Radio Frequency
 - └ TX05.2.6 Innovative Antennas

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System